

1. A method of assessing the suitability of customer telephone lines for data transmission, comprising:  
selecting a telephone line having tip and ring wires  
via a test access of a switching station;

5 electrically connecting the tip and ring wires together adjacent one end of the selected line to form a common mode configuration;

performing single-ended electrical measurements by driving the wires in the common mode configuration with  
10 respect to ground; and

determining an electrical property of the wires from the single ended measurements.

2. The method of claim 1, wherein the determining comprises finding an impedance (Z) of the wires in the  
15 common mode configuration.

3. The method of claim 2, wherein the performing comprises driving the wires at low frequencies and the act of the determining finds a property at a high frequency, the high frequency being at least ten times the highest one of  
20 the low frequencies.

4. The method of claim 2, wherein the determining comprises calculating an attenuation from the impedance.

5. The method of claim 4, wherein the measuring comprises finding a capacitance (C) for the tip and ring  
25 wires in the common mode configuration.

6. The method of claim 5, wherein the calculating uses a formula to obtain the attenuation (A(f)), the formula

being  $A(f) = K[ Z^2 + (2\pi fC)^{-2} ]^{-1/2}$ , the  $f$  being the frequency, and the  $K$  being a number.

7. The method of claim 2, further comprising:  
determining whether the selected line has a line

5 fault; and

disqualifying the line in response to finding the line fault.

8. The method of claim 2, wherein the fault is a speed inhibiting fault.

9. The method of claim 8, wherein the speed  
10 inhibiting fault includes one of a resistance imbalance, a bridged tap, a load coil, and a noise level above a preselected threshold.

10. The method of claim 8, wherein the line fault  
15 includes a metallic fault.

11. The method of claim 10, wherein the metallic fault includes one of a capacitance imbalance, a short to ground, a short to a voltage source, and an intermediate short between the tip and ring wires.

12. The method of claim 10, further comprising:  
20 determining whether the selected line has a speed inhibiting fault; and

disqualifying the line in response to finding the speed inhibiting fault.

13. The method of claim 8, wherein the act of determining an electrical property includes calculating an attenuation for the line using the electrical measurements.

14. A system for determining signal attenuations of customer telephone lines, each line having tip and ring wires, comprising:

a measurement unit having first and second input terminals to couple to a test access of a telephony switch, the measurement unit capable of driving the input terminals in a common mode configuration to perform single-ended impedance measurements on the tip and ring wires of the customer lines.

15. The system of claim 14, wherein the measurement unit further comprises:

a voltmeter coupled to measure a voltage driving said input terminals in the common mode configuration; and  
an ammeter coupled to measure a current going to said input terminals in the common mode configuration.

16. The system of claim 15, wherein the measurement unit further comprises:

a signal generator connected to the first and second terminals to drive said terminals in the common mode configuration.

17. The system of claim 15, wherein the measurement unit further comprises apparatus to perform single-ended measurements to detect one of metallic faults and speed inhibiting faults on the customer lines.

18. The system of claim 14, further comprising:

a processor coupled to the measurement unit and capable of coupling to the switch, the processor having a data storage medium encoding a program of instructions for a method, the method comprising:

5       ordering the measurement unit to perform the single-ended measurements; and

analyzing results of the ordered measurements to determine a signal attenuation of the one of the customer lines.

10       19. The system of claim 18, wherein the method further comprises:

determining whether the one of the lines is qualified to transmit data from the signal attenuation.

15       20. The system of claim 18, wherein the signal attenuation corresponds to a frequency at least ten times frequencies at which the measurement unit is capable of driving the one of the lines through the test access.

21. The system of claim 18, wherein the method further comprises:

20       ordering the switch to transfer connections for the one of the lines from the network to the test access prior to the act of ordering the measurement unit.

22. The system of claim 14, further comprising:

25       the switch having the test access, the switch being a central office switch.

23. The system of claim 17, wherein the test access is adapted to transmit electrical signals having voice-range frequencies.

24. A program storage device encoding an executable program of instructions for a method of determining the signal attenuation of customer telephone lines connected to a central switch, the method comprising:

5 ordering the switch to transfer connections for one of the lines from the network to a test access of the switch;

ordering a measurement unit to perform single-ended impedance measurements on tip and ring wires of one of the  
10 lines by driving the tip and ring wires in a common mode configuration using the test access; and

analyzing results of the ordered measurements to determine a signal attenuation of the one of the customer lines.

15 25. The device of claim 24, wherein the method further comprises:

determining whether the one of the lines is qualified to transmit data from the signal attenuation.

20 26. The device of claim 24, wherein the signal attenuation corresponds to a frequency (f) at least ten times signal frequencies of the single-ended measurements.

27. The device of claim 26, wherein the act of analyzing comprises:

calculating the attenuation (A) based on a formula,  
25 the formula being  $A(f) = K[ Z^2 + (2\pi fC)^{-2} ]^{-1/2}$ , and

wherein Z and C are the respective impedance and capacitance of the line in the common mode configuration.

28. The device of claim 24, the method further comprising:

determining whether the selected line has a line fault; and

disqualifying the line in response to determining that the line has a fault.

5           29. A method of marketing customer telephone lines for a selected data transmission service, each line having associated tip and ring wires, comprising:

10           automatically performing single-ended electrical measurements on a selected plurality of customer telephone lines while the associated tip and ring wires are connected together in a common mode configuration;

15           determining which of the customer lines qualify for the selected data service from the measurements;

20           sorting the lines based on final distribution points and qualification for the data service; and

25           offering the selected data service to a portion of the customers in response to said portion having qualified lines available.

30           30. The method of claim 29, further comprising:  
35           billing customers for usage of the lines at rates depending on whether the lines qualified for the selected data transmission service.

40           31. The method of claim 29, wherein the act of determining includes finding a signal attenuation of the lines and qualifying lines having signal attenuations below a preselected threshold.

45           32. The method of claim 31, further comprising:  
50           monitoring a second portion of the customer lines after being placed in service by

36. The method of claim 35, wherein the act of determining includes finding a signal attenuation of the tested lines and qualifying the tested lines having signal attenuations below a preselected threshold.

5 37. The method of claim 34, wherein the act of performing tests is responsive to receiving a request from the customer for the selected data service.

repeatedly performing one-ended common-modes  
electrical measurements on the second portion; and  
determining which of the lines of the second portion  
are qualified for the selected data transmission service  
5 from the repeated measurements.

33. The method of claim 29, further comprising:  
providing the data transmission service for a second  
portion of the lines qualified for the selected data  
transmission service in response to receiving requests from  
10 the associated customers for the service.

34. A method of marketing data transmission  
services to customers over telephone lines having associated  
tip and ring wires, comprising:

performing single-ended electrical tests on a  
15 plurality of telephone lines connected to a final  
distribution near where a customer is located, the tests  
driving tip and ring wires of the lines under test in a  
common mode configuration;

determining whether the tested lines qualify for a  
20 selected data service; and

offering the data service to the customer over one  
of the tested lines in response to the one of the tested  
lines being qualified.

35. The method of claim 34, further comprising:  
25 swapping the one of the tested lines with a line  
originally used by the customer in response to the line  
originally used by the customer being disqualified for the  
data service.